Final Abstract Number: 55.033
Session: Diagnostics
Date: Saturday, June 16, 2012
Time: 12:45-14:15
Room: Poster & Exhibition Area

Comparative evaluation of dengue NS1 antigen detection assay and indirect fluorescent-antibody (IFA) test for detection of dengue virus in C6/36 cell line

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Background: Dengue is an endemic arboviral disease affecting 2.5 billion people of more than 100 countries. Every year large number of cases are reported. The disease requires highly sensitive, specific and quick diagnosis strategies. Indirect fluorescent-antibody test has been used by most of the laboratories for detection of virus. This study was undertaken to evaluate NS1 antigen detection assay for confirmation of dengue virus in infected C6/36 cell line in comparison of indirect fluorescent-antibody (IFA) test.

Methods: C6/36 cell line was infected with acute phase serum samples of dengue suspected patients. After 7 days IFA test and NS1 antigen detection assay was done on cell culture fluid to confirm presence of virus. The sensitivity and specificity of NS1 antigen detection assay was determined, considering IFA test as standard method for virus isolation.

Results: 103 samples were included in study. 45 samples were positive in IFA test (43.68% positivity) and 43 samples were positive in NS1 antigen detection assay (41.74% positivity).The sensitivity and specificity of NS1 antigen detection assay was 95.55% and 100.0% respectively. The efficiency of NS1 antigen detection assay was 98.05%. Positive predictive value was 100.0% and negative predictive value was 96.66%.

Conclusion: Isolation of dengue virus is essential for research and diagnosis purpose of disease. Our result indicates that NS1 antigen detection assay can also be useful as confirmatory test for virus detection in cell culture especially during outbreaks when large numbers of samples are difficult to process.

http://dx.doi.org/10.1016/j.ijid.2012.05.544

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Assessment of the rapid diagnostic test Immunoquick+4 malaria for the diagnosis of malaria in Kuwait

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Background: The correct and timely diagnosis of malaria infection in a severe ill patient is in fact of critical importance since symptoms of complicated malaria may suddenly develop, possibly leading to death despite intensive care. In the present study theImmunoquick+4 malaria, a three-band malaria rapid diagnostic test (MRDT) targeting histidine-rich protein-2 (HRP-2) and pan *Plasmodium*-specific parasite lactate dehydrogenase, is evaluated and compared with Giemsa stained microscopy in Kuwait.

Methods: Thick and thin blood films were made from all the immigrants coming from malaria endemic countries, stained with Giemsa and screened for the presence of malaria. All the infected individuals were compared with Immunoquick+4 malaria test.

Results: About 264,442 immigrants were checked in 2011 and 98 (0.037%) were found positive. Only *P. vivax* and *P. falciparum* species of malaria were detected and their distribution was found as; *P. vivax* 37.00%; *P. falciparum* 13.00%; and mixed infection of *P. falciparum* and *P. vivax* 50.00%. After 8-10 days the blood samples were taken again to evaluate the Immunoquick+4 malaria test. The infection with *P. vivax* was found in 40.00% and *P. falciparum* in 10.00% in Immunoquick+4 malaria test, respectively. The Immunoquick+4 malaria test can not differentiate the four species of malaria and gives false positive results at very low densities of parasites. Giemsa stained microscopy was used as the reference standard.

The sensitivities for *P. falciparum* tested were 67.0%, reaching 100% at parasite densities >1,000/μl. Sensitivity at parasite densities ≤ 100/μl was 5.0%. The overall sensitivities for *Plasmodium vivax was* 86.0% reaching 94.0% at parasite densities >500/μl. None of the *Plasmodium* negative samples in microscopy reacted positive.

Conclusion: The sensitivity of Immunoquick+4 malaria test was very poor at low (≤ 100/μl) parasite densities, whereas, performed well for both *P. vivax* and *P. falciparum* samples at higher (>500/μl) parasite densities. The Immunoquick+4 malaria test may be as good as Giemsa's stained thick and thin blood films in the diagnosis of malaria in very remote areas where proper laboratory facilities and well trained microscopists are not available. The test is simple and the results are available in 5-10 minutes.

http://dx.doi.org/10.1016/j.ijid.2012.05.545